



# **Armed Forces College of Medicine AFCM**





# ARTERIES OF THE THORAX

By

**Prof. Dr.: Eman Habib**



# INTENDED LEARNING OBJECTIVES (ILO)

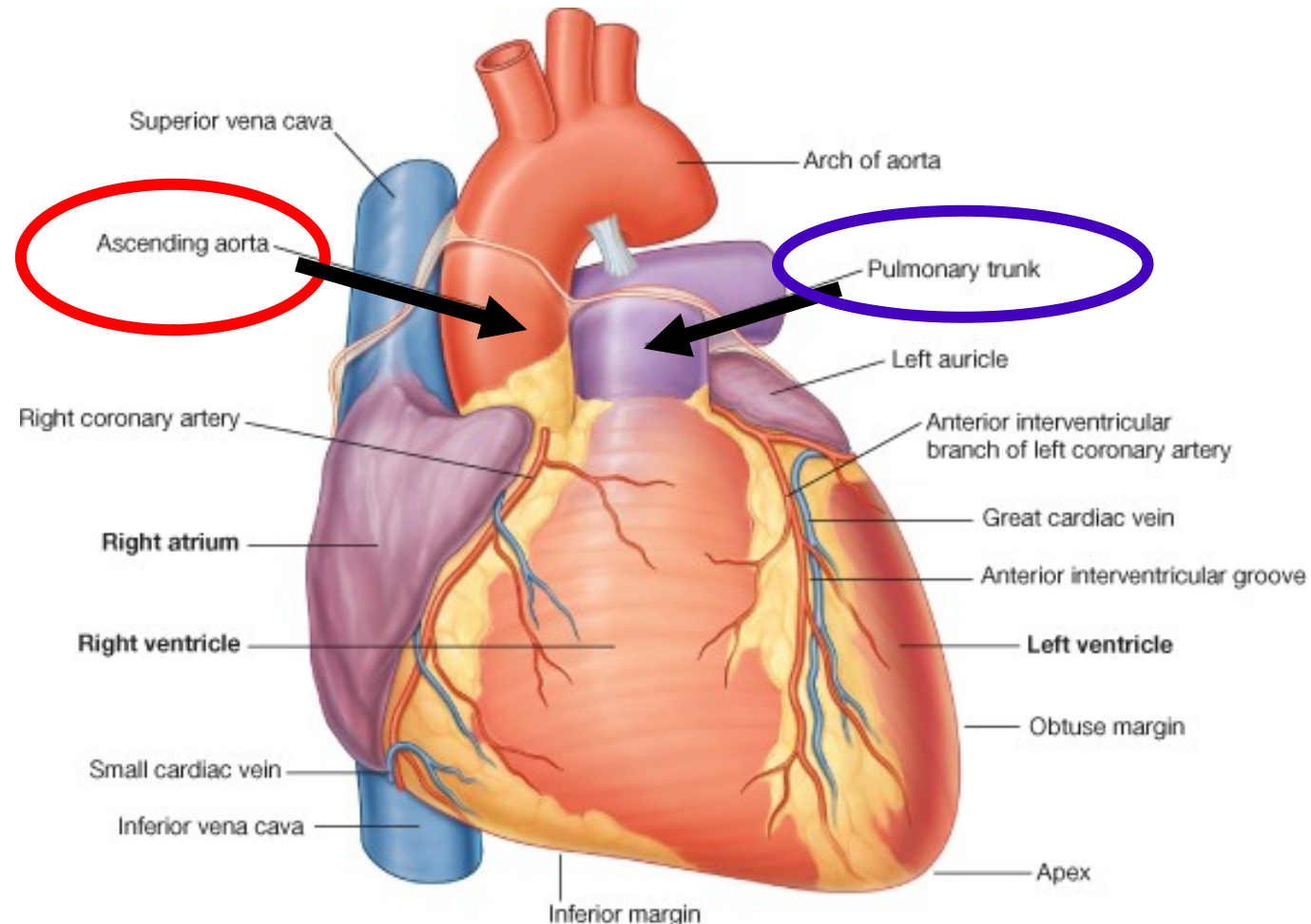


By the end of this lecture the student will be able to:

1. Describe, beginning, course, termination, important relations and branches of the arteries of the thorax
2. Correlate the congenital narrowing of aorta with its relevant clinical significance



# Arteries of The Thorax



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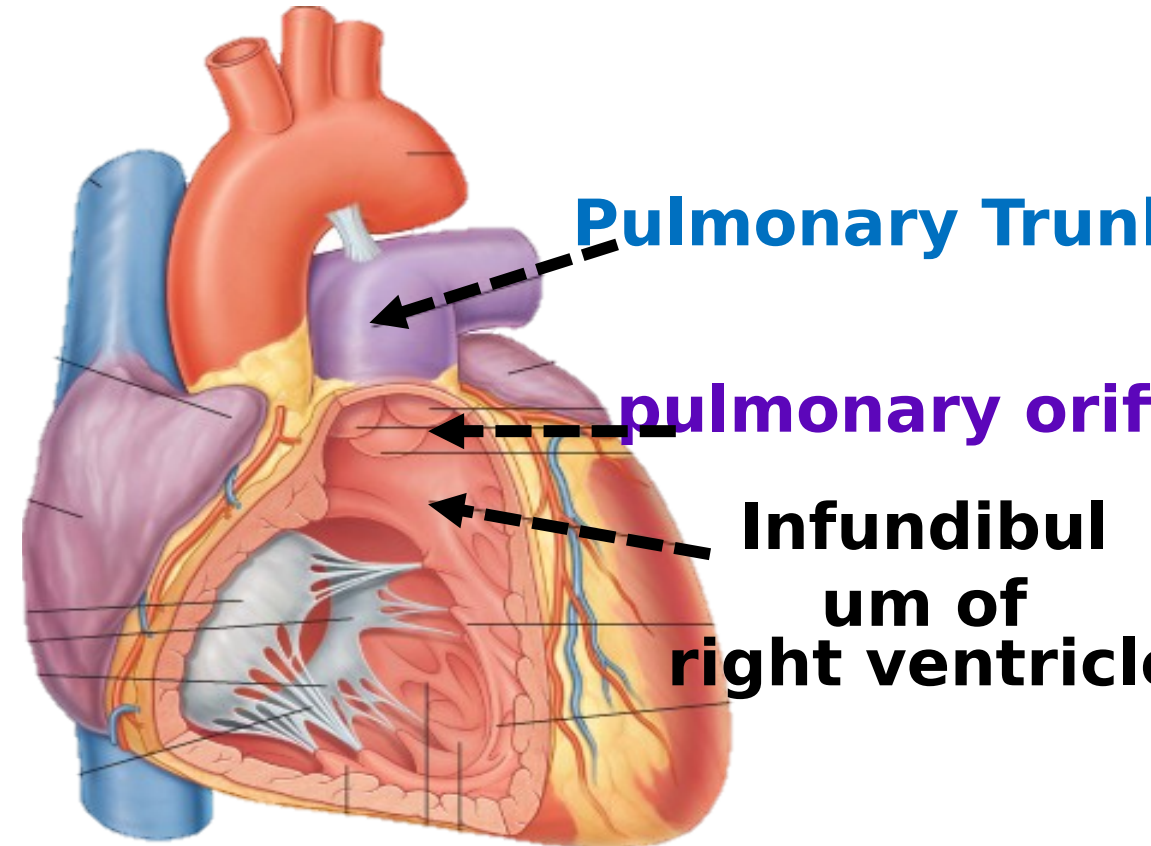




# The Pulmonary Trunk



- ❑ A large trunk which carries deoxygenated blood from right ventricle → lungs.
- ❑ Arises from **infundibulum** of **right ventricle** at pulmonary orifice
- ❑ It lies entirely inside fibrous pericardium (in middle mediastinum).



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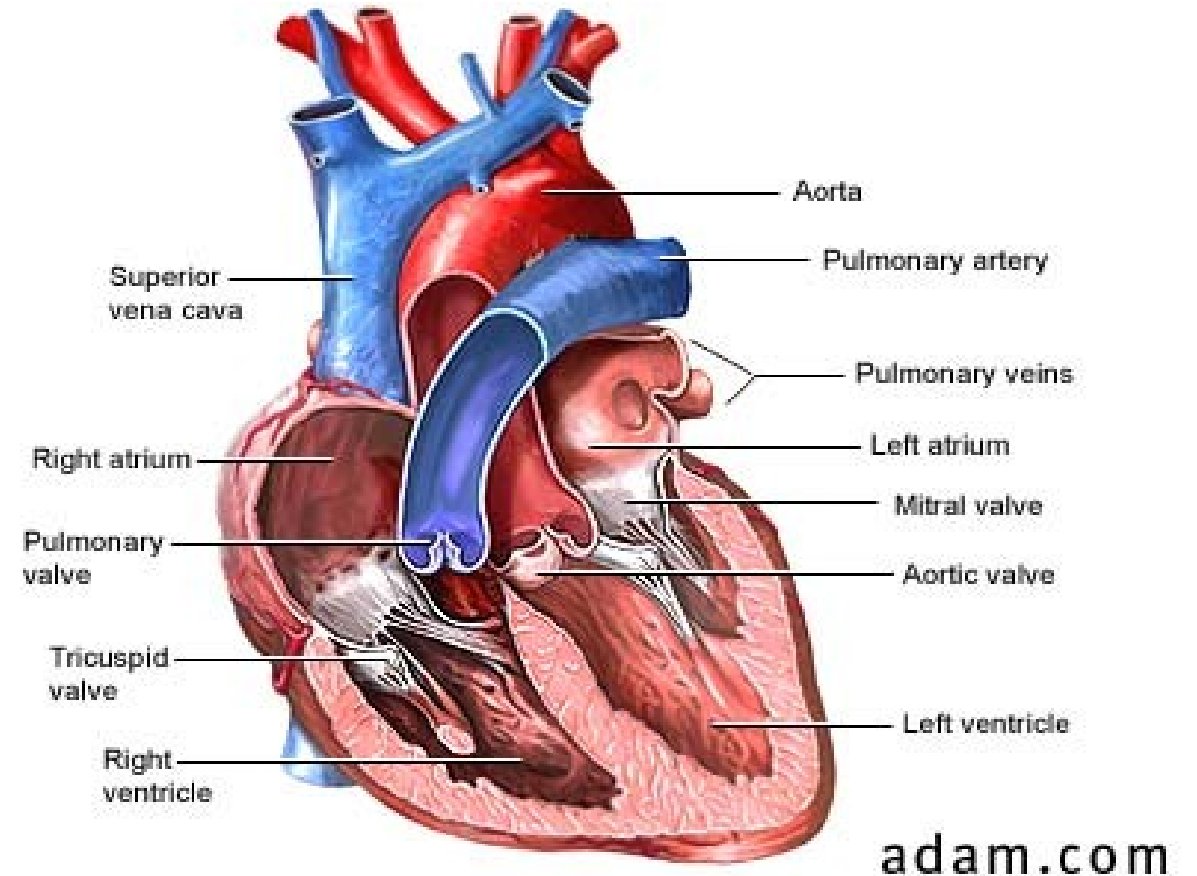


# The pulmonary trunk



## Course

- ❑ Passes upwards, backwards & to the left.
- ❑ At first, it lies **anterior** to ascending aorta. Then it becomes on **left side** of **ascending aorta**.

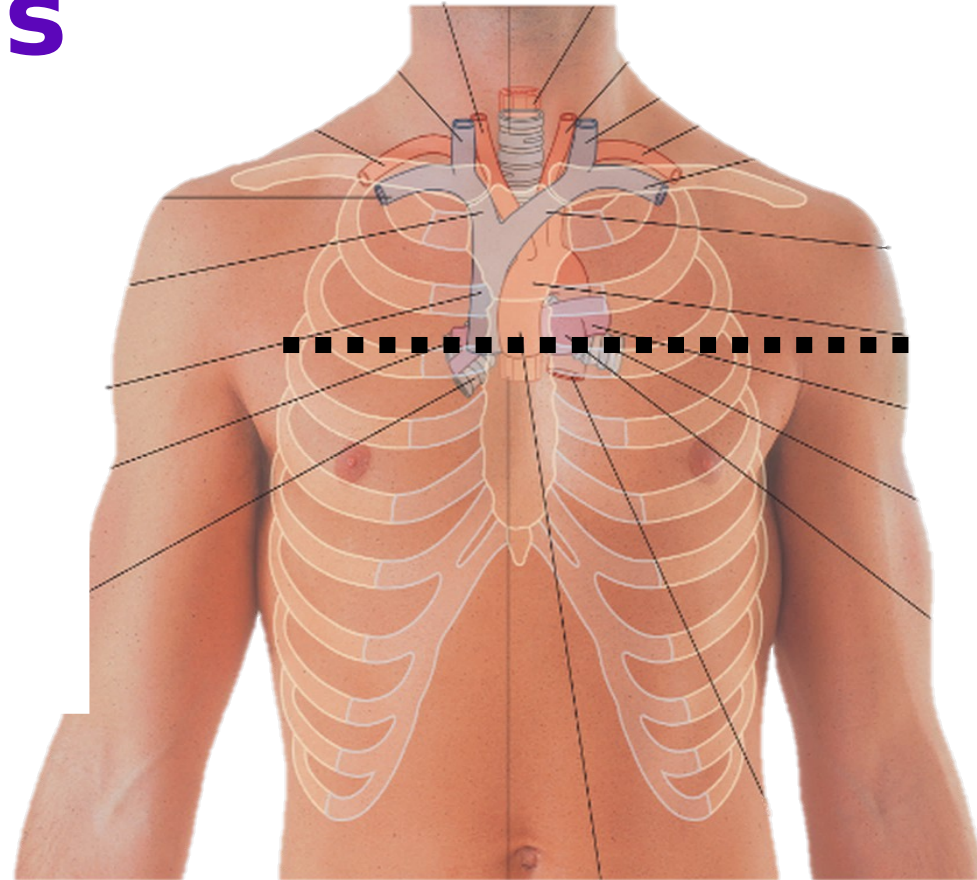


# Pulmonary trunk ends at :

the left second costal cartilage

**the pulmonary trunk  
divides into the:**

- 1. Right pulmonary artery.**
- 2. Left pulmonary artery.**



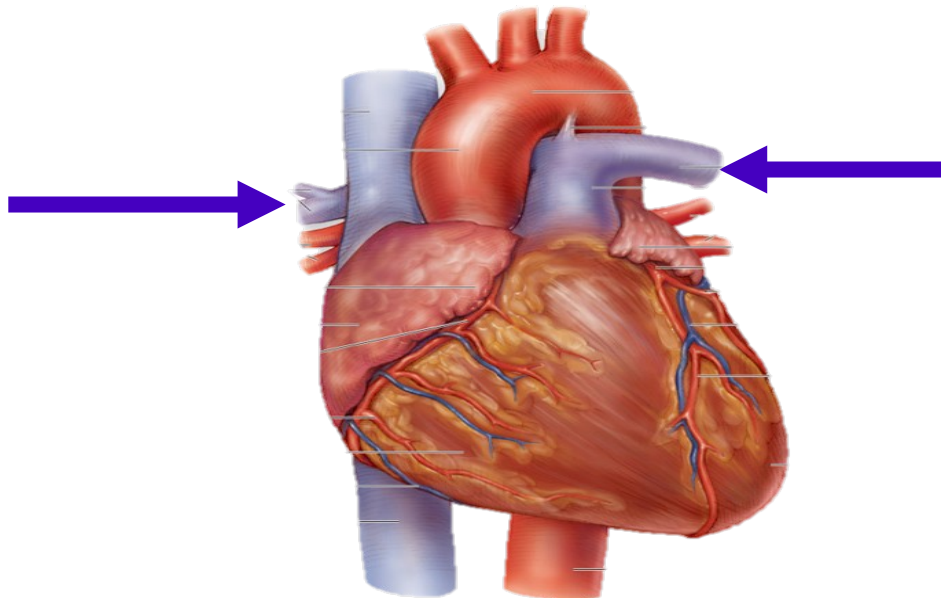
**Left  
2ndcc**

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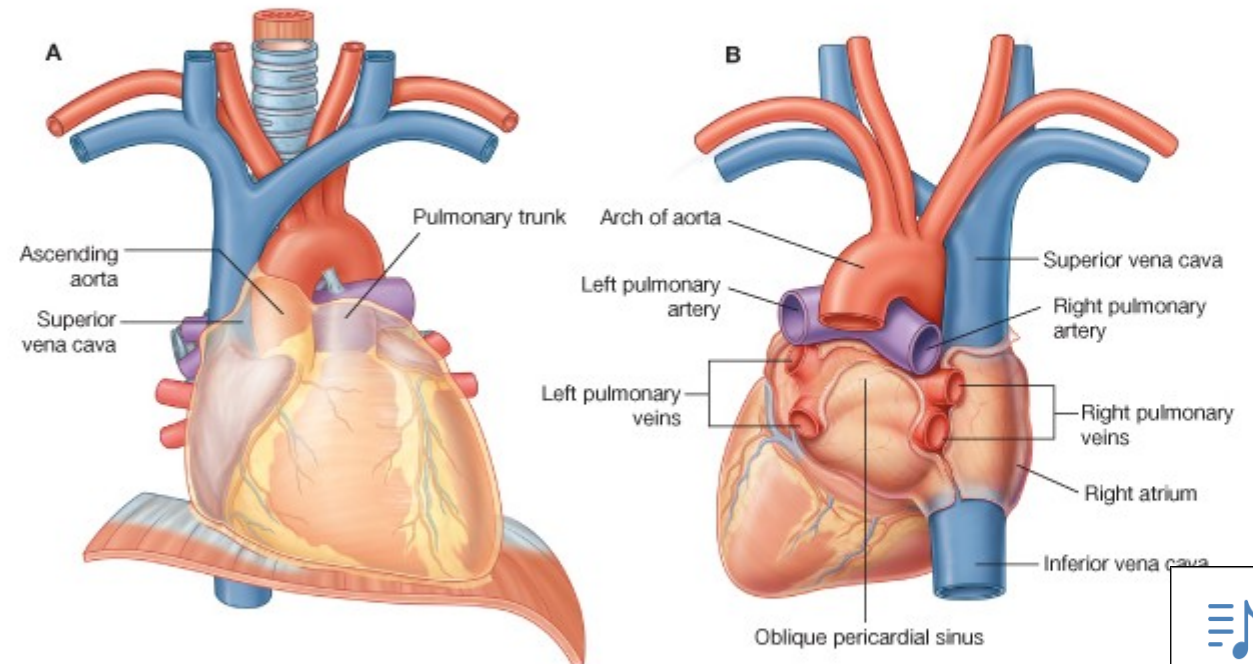
## Right pulmonary artery

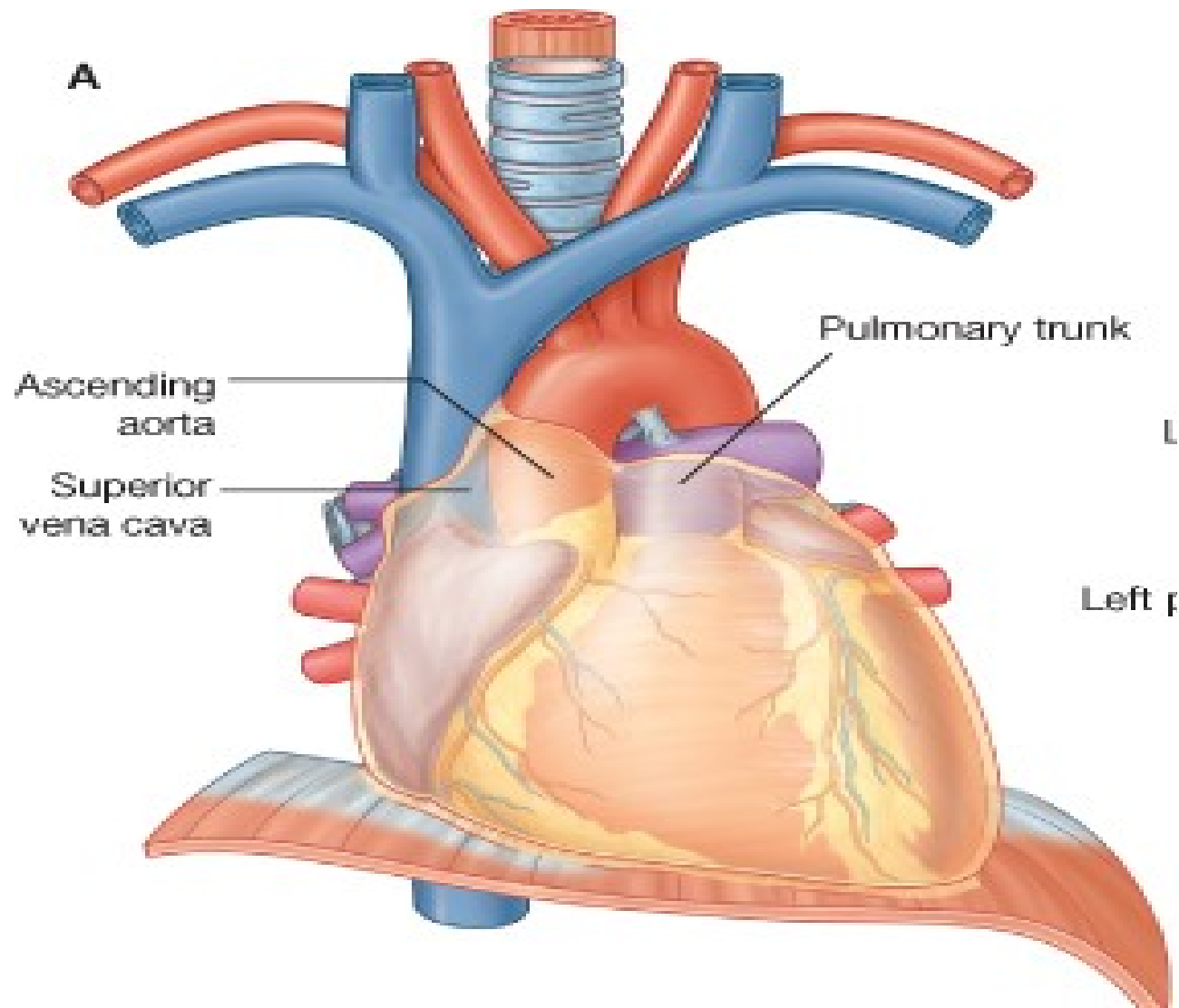
- Passes to the right side behind ascending aorta and superior vena cava to enter the right lung.



## Left pulmonary artery

- Passes to the left side below the arch of the aorta and anterior to descending thoracic







Question:

Compare between right and left pulmonary artery



# THE THORACIC AORTA

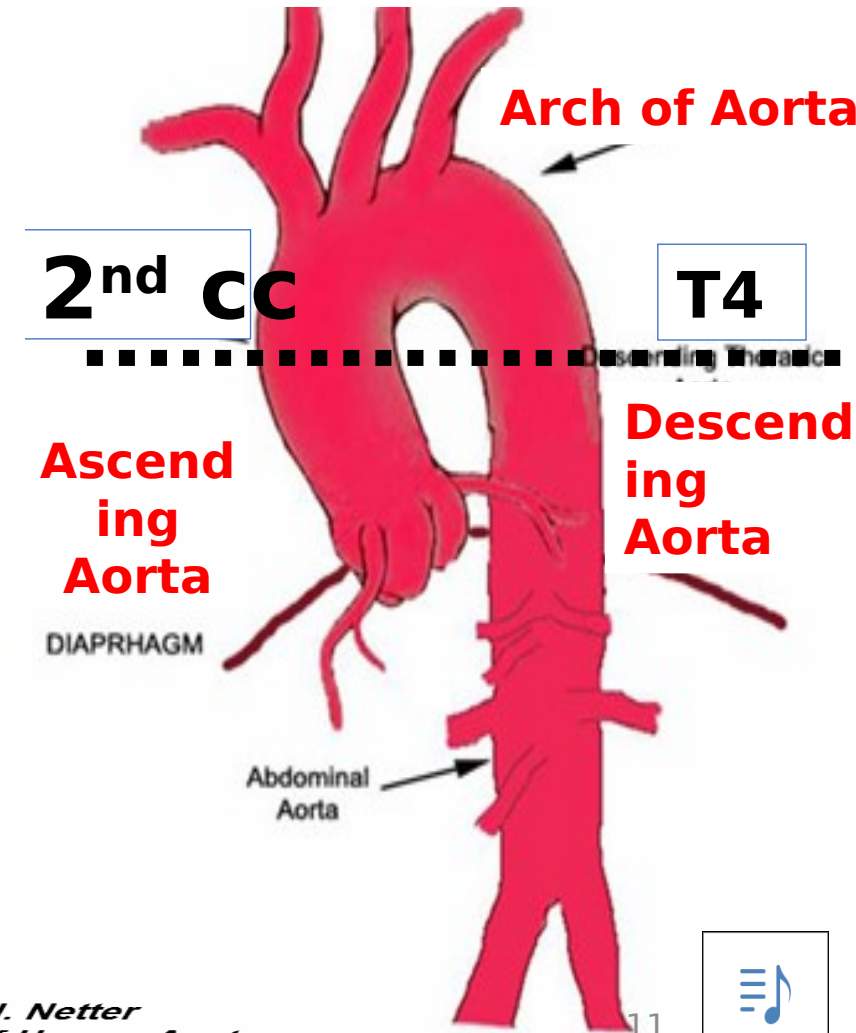
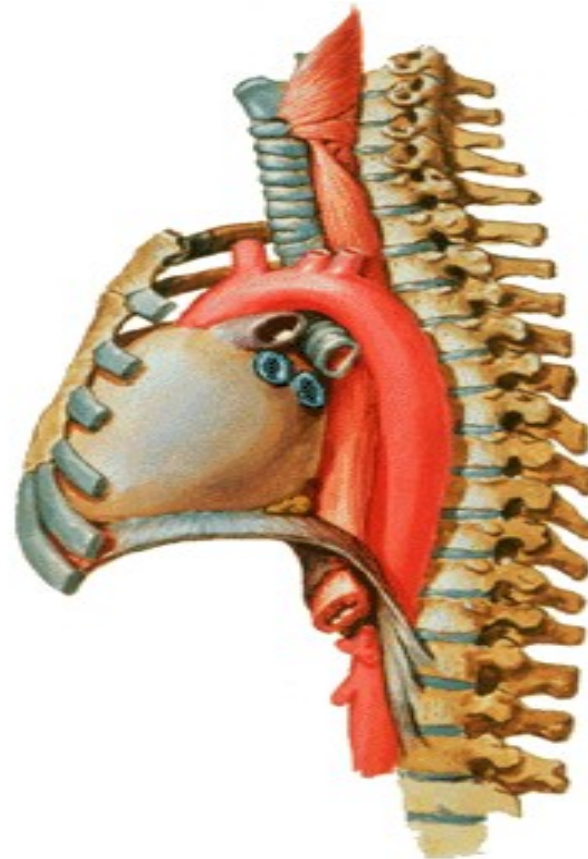


is divided into 3 parts

**1- Ascending Aorta**

**2- Arch Of Aorta**

**3- Descending Aorta**

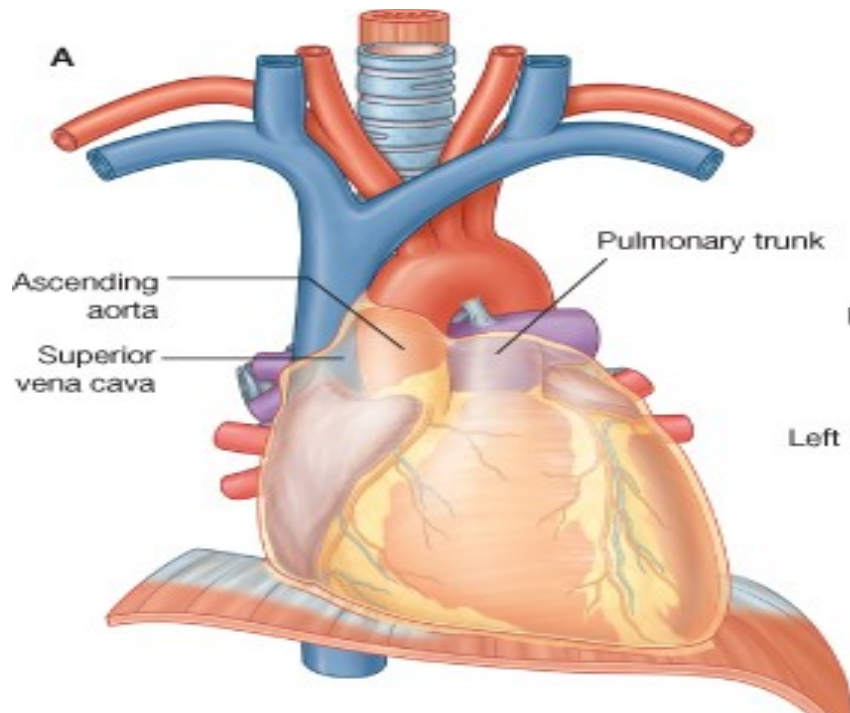


# Ascending Aorta

**Begins :** at aortic orifice at base of left ventricle

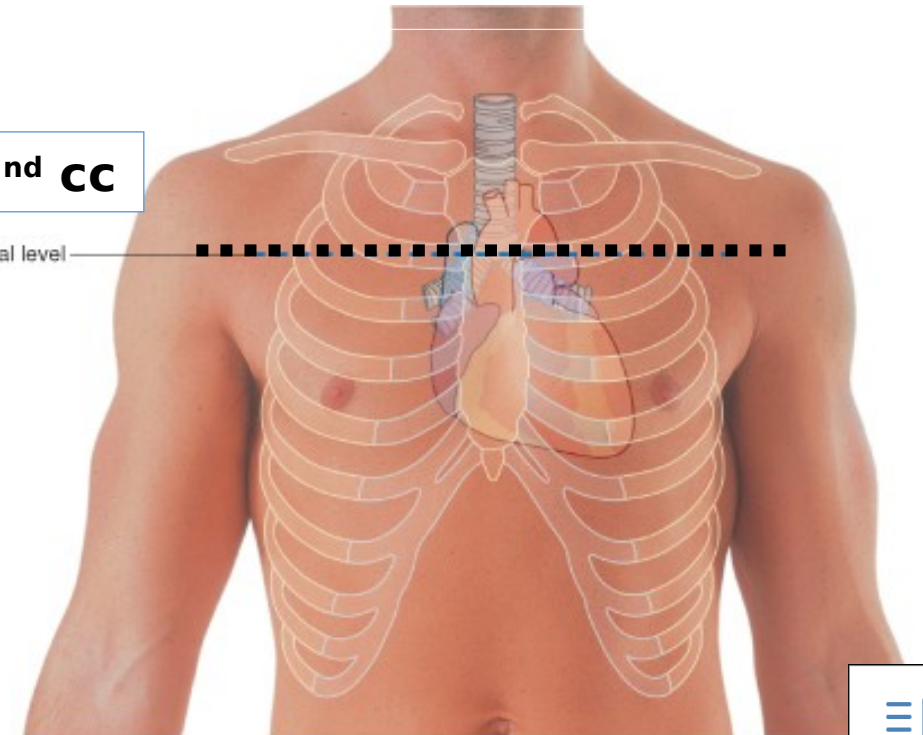
which is level with the lower edge of the third left costal cartilage.

**Ends :** right 2<sup>nd</sup> costal cartilage by forming arch of aorta.



**Right 2<sup>nd</sup> cc**

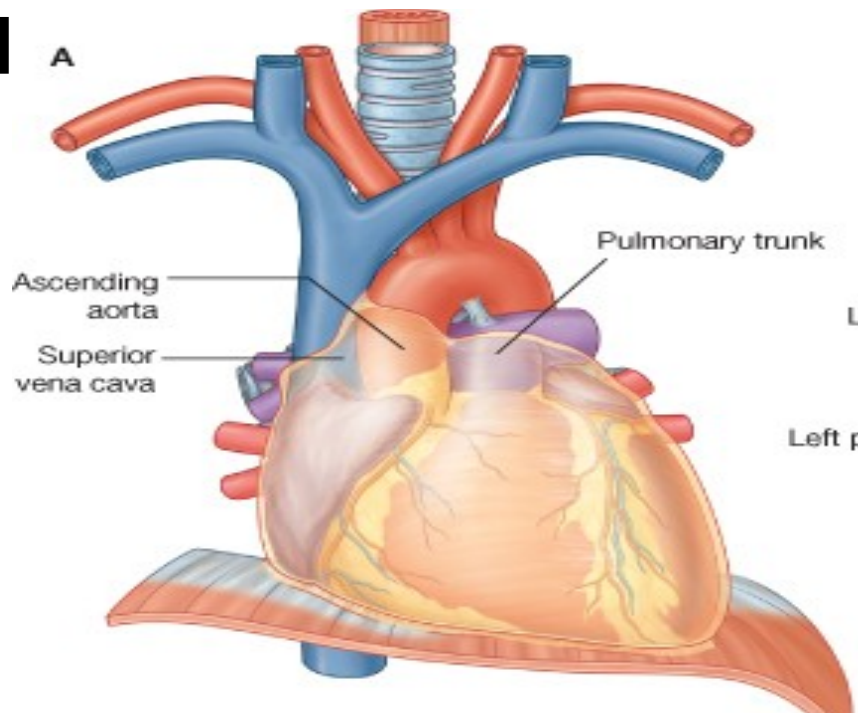
TIV/V vertebral level



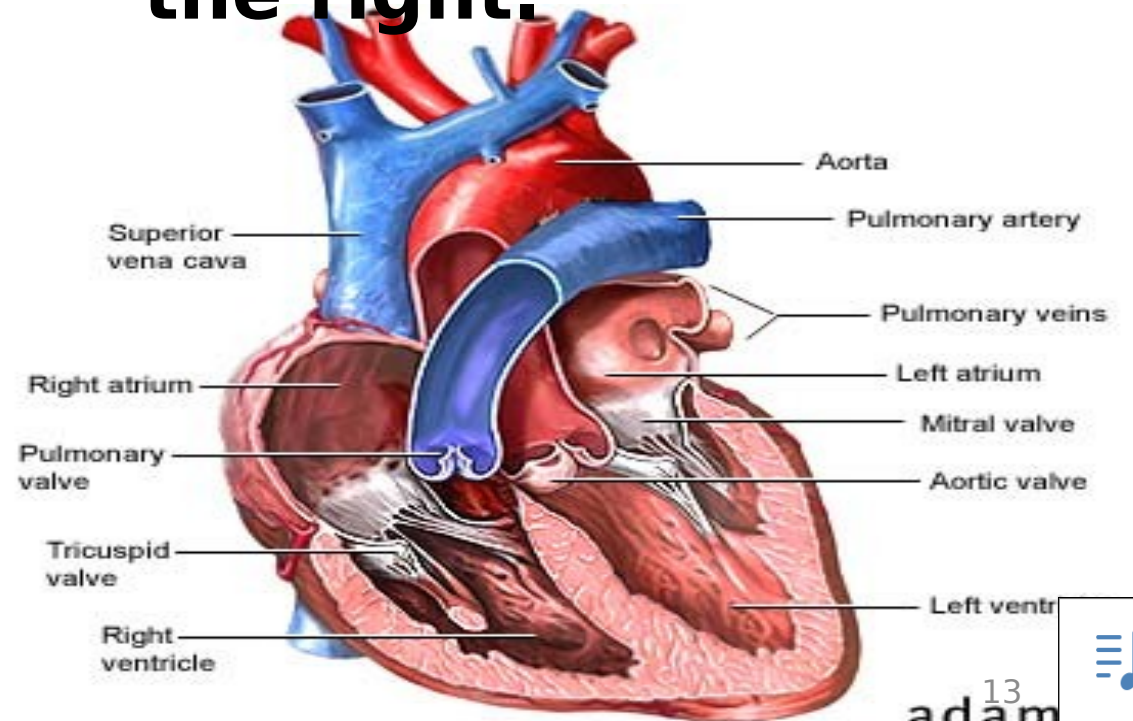


# Ascending Aorta

- ❑ Lies completely inside the fibrous pericardium (mid



- ❑ Course : ascends upwards, forwards & to the right.



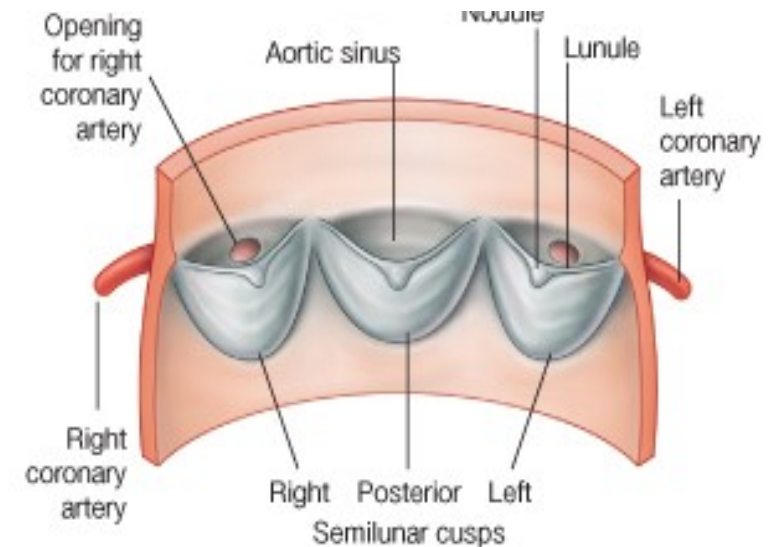
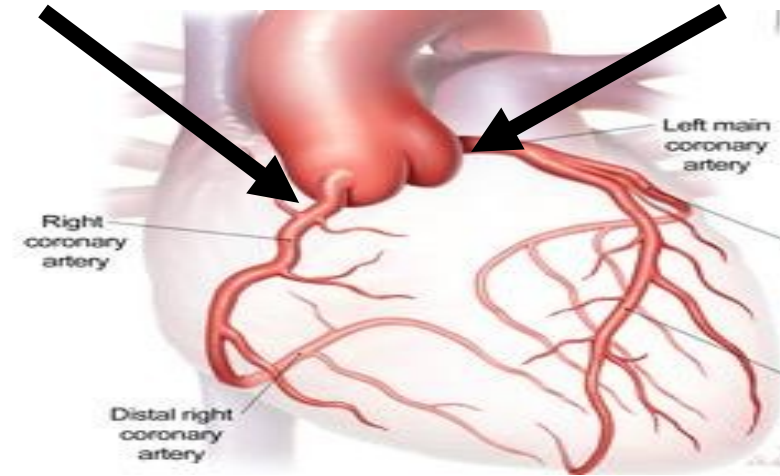
# Branches of ascending aorta

**Three dilatations at beginning of aorta (aortic sinuses)**

arise from anterior aortic sinus

## **2. Left coronary artery**

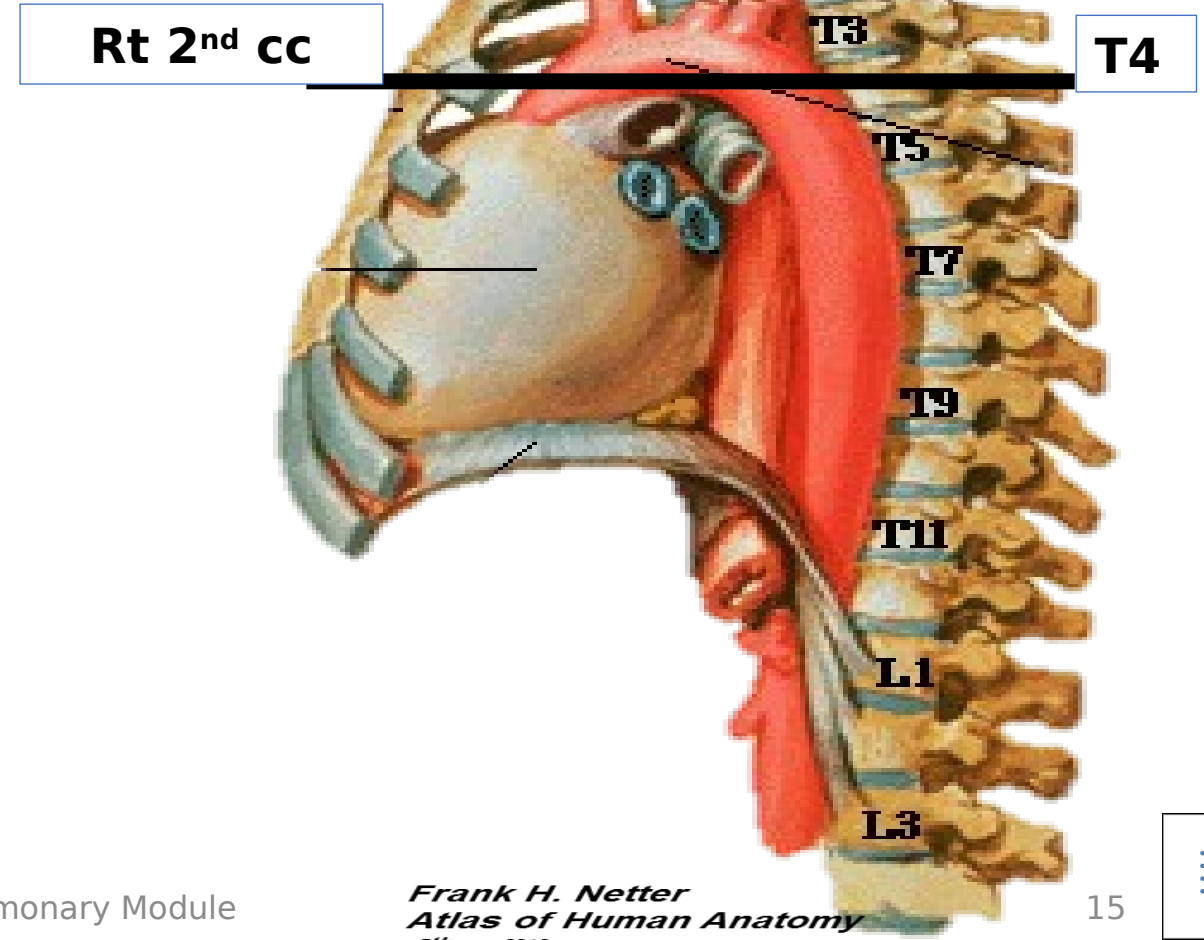
arise from left posterior aortic sinus



# Arch of Aorta



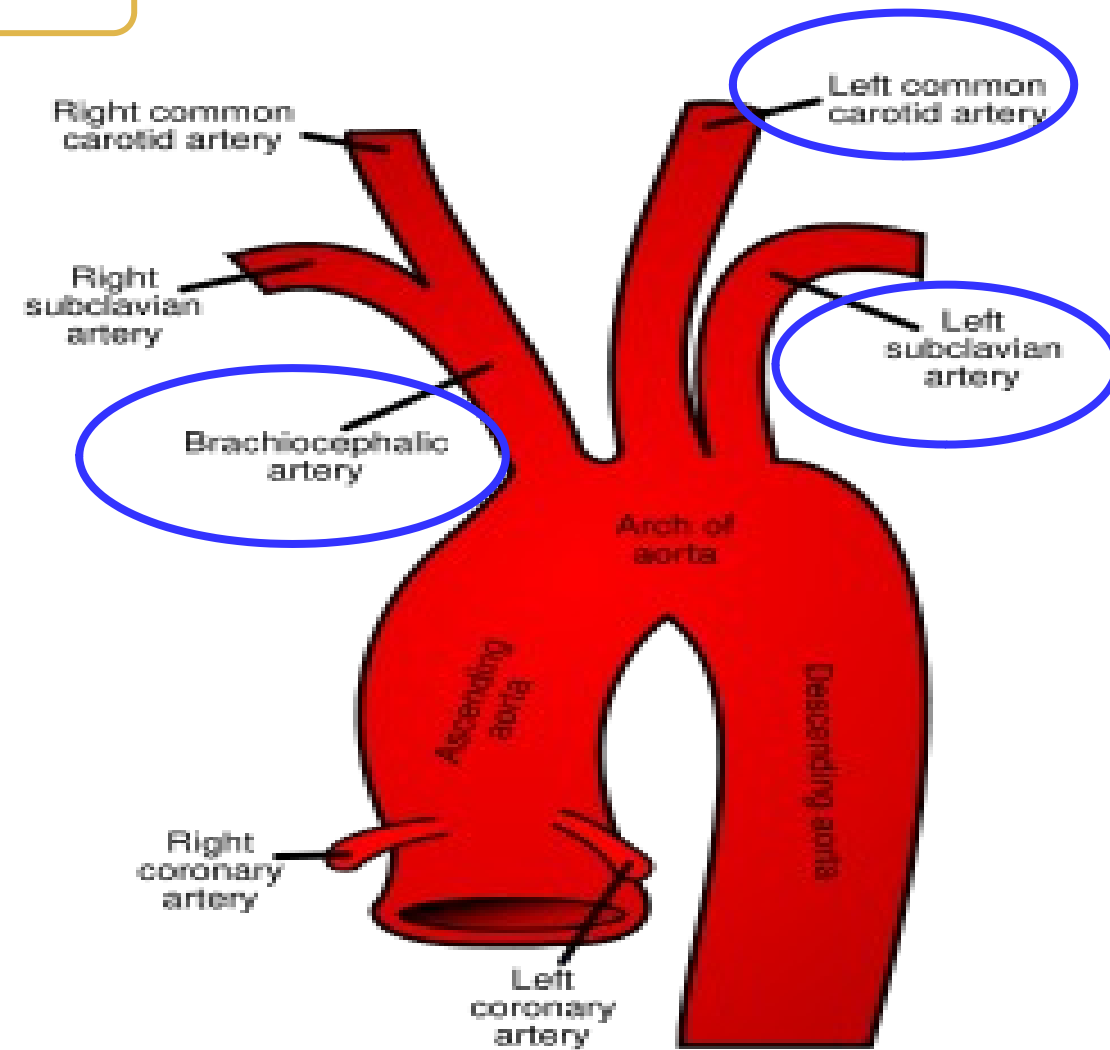
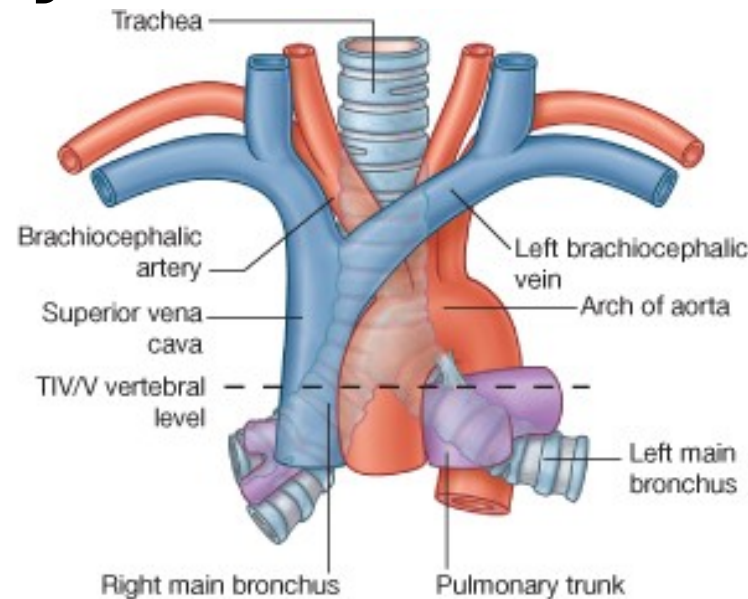
- **Origin** : begins as continuation of ascending aorta at right 2<sup>nd</sup> costal cart.
- **Course** : forms an arch behind lower 1/2 of manubrium sterni.
- **Direction of arch** : upwards , backwards & to the left.
- **Ends**: at lower border of T4 by forming descending



## Branches of Arch of Aorta

- 1. Brachiocephalic artery.**
- 2. Left common carotid artery.**
- 3. Left subclavian artery.**

# All 3 branches are crossed anteriorly by the left innominate



**T = Trachea**

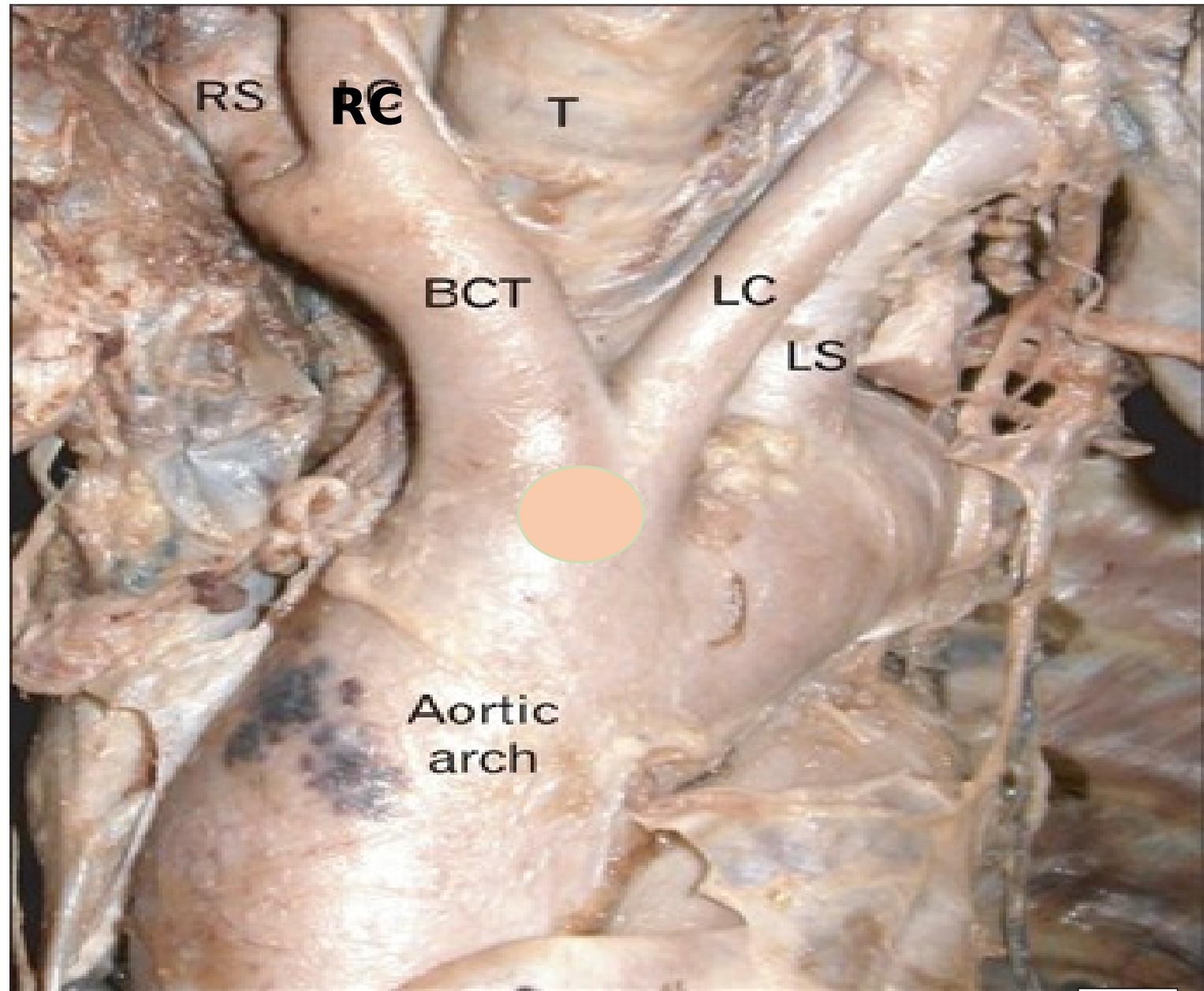
**BCT = Brachiocephalic artery**

**RC = Rt common carotid**

**RS = Rt Subclavian artery**

**LC = Lt common carotid**

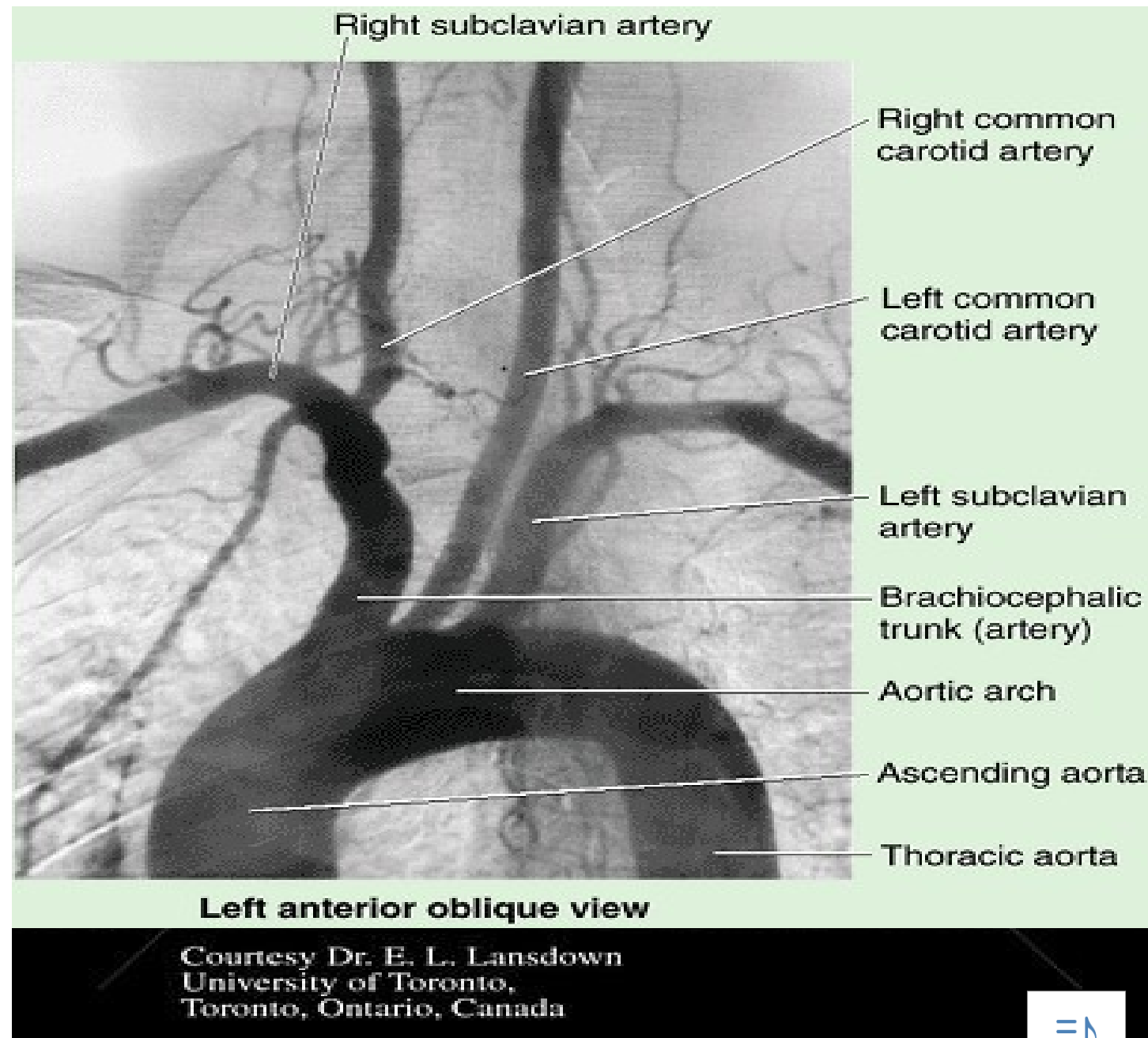
**LS = Lt Subclavian artery**





## **Aortic angiogram.**

The arch of aorta and the typical arrangement of its branches are visible



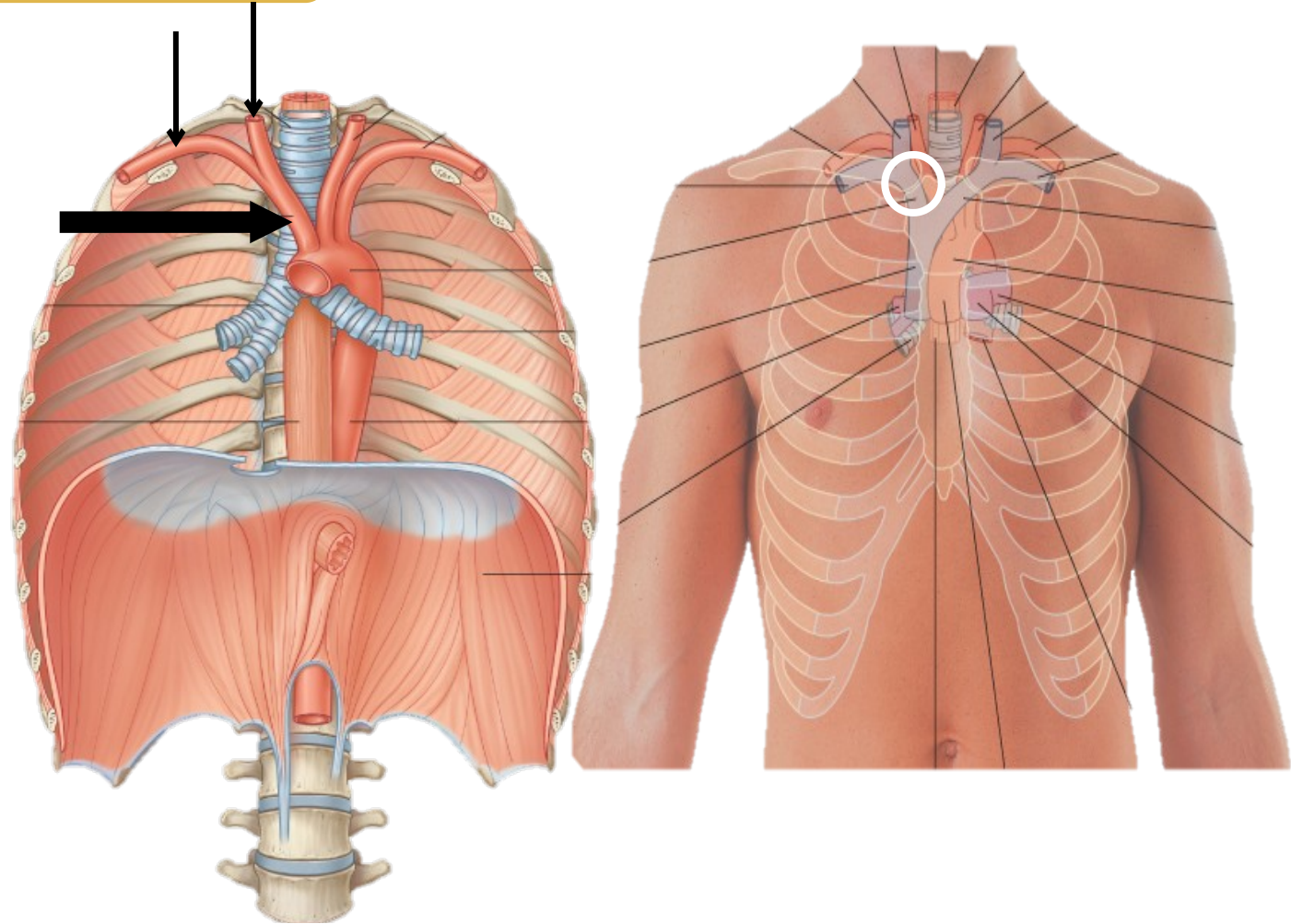
# 1. Brachiocephalic artery

It is the largest of the 3 branches of the aortic arch.

Ends at right sternoclavicular joint by dividing into:

1. Right common carotid artery □ supplies right half of head & neck.
2. Right subclavian artery □ supplies right upper limb.

Occasionally gives □ **thyroid ima** artery □ to thyroid gland.



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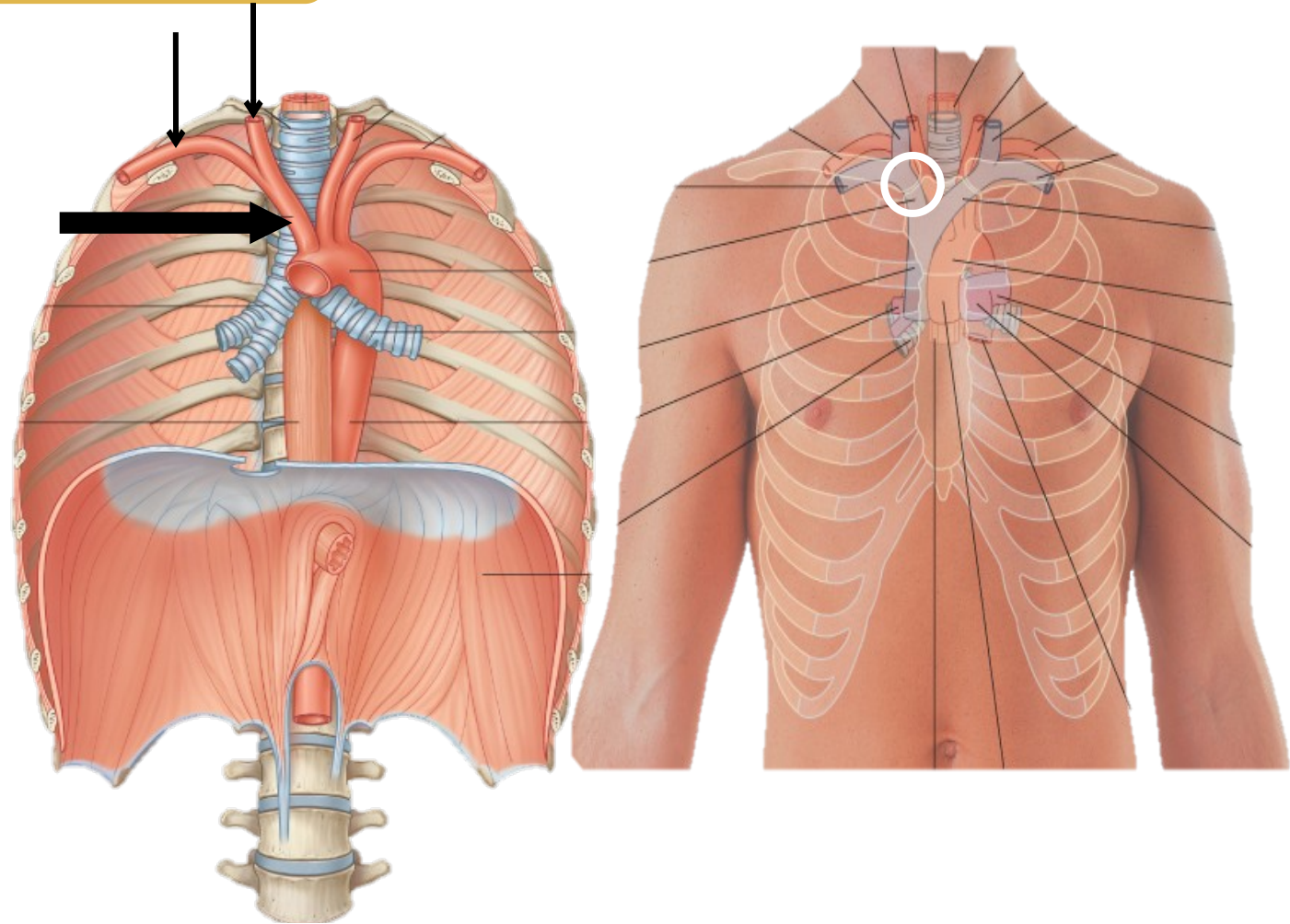


# 1. Brachiocephalic artery

**It is the largest of the 3 branches of the aortic arch.**

**Ends at right sternoclavicular joint by dividing into:**

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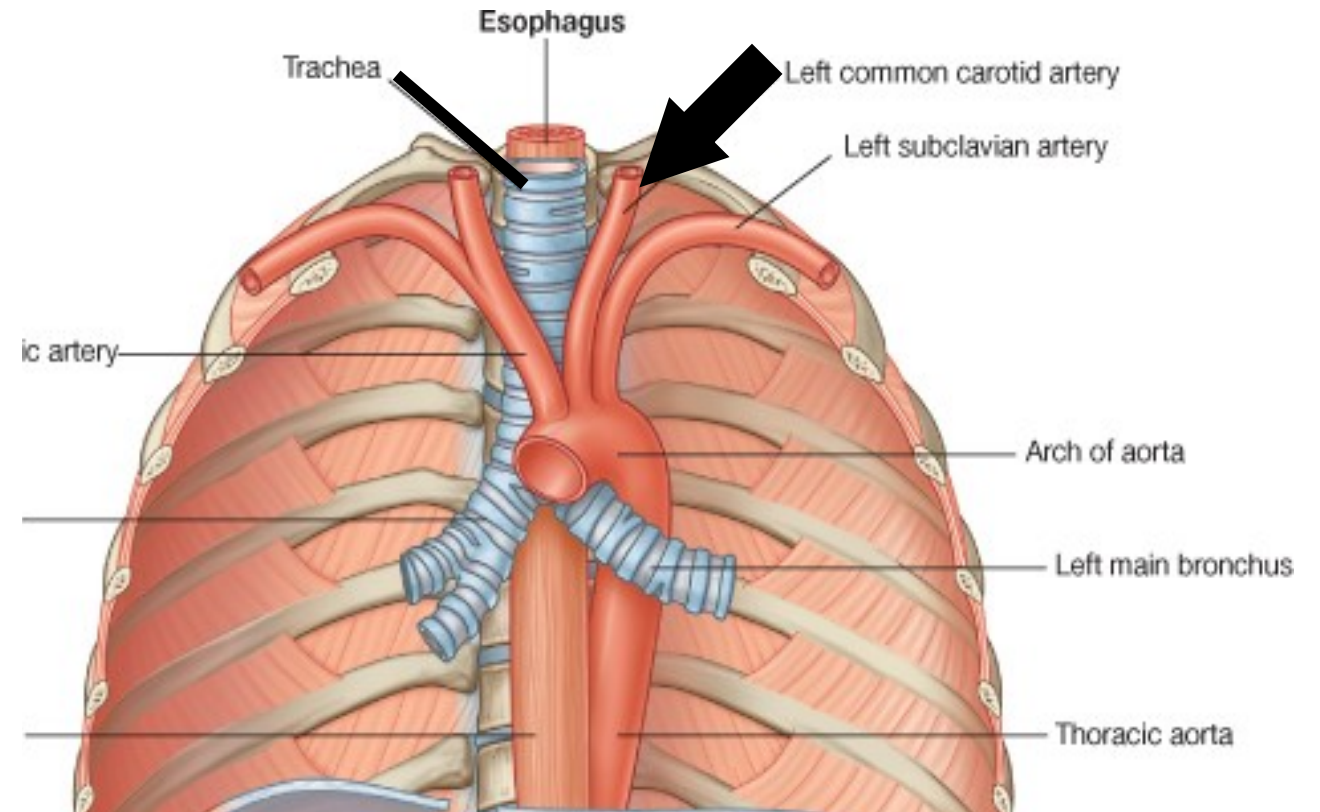




## 2. Left common carotid artery

**Ascends along left side of the trachea, separating it from left lung.**

**Supplies left half of head & neck.**



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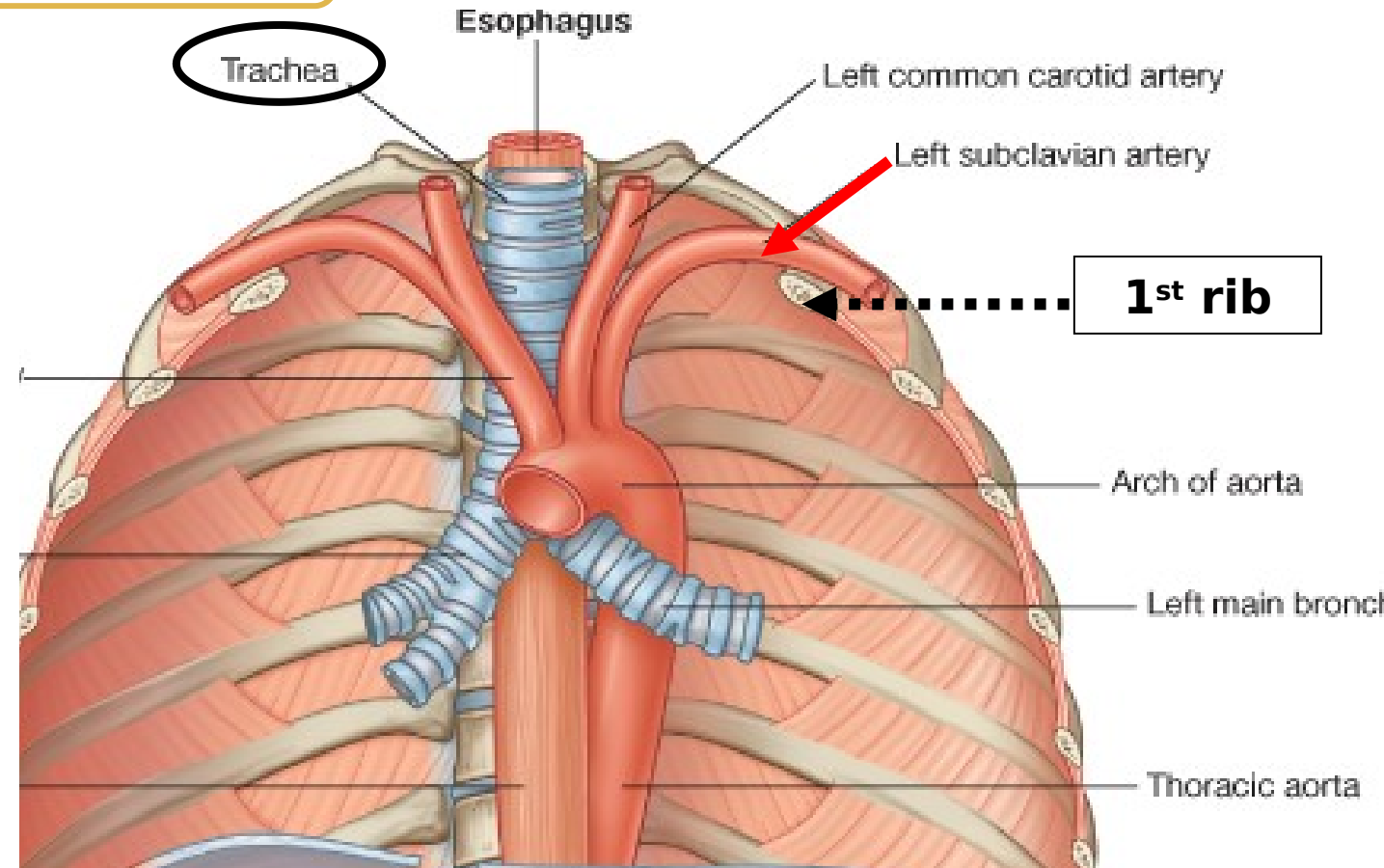
### 3. Left subclavian artery

Arises : from arch of aorta slightly to the left of & posterior to the left common carotid.

Ascends to the left side of trachea

Passes on upper surface of 1<sup>st</sup> rib.

Ends at outer border of 1<sup>st</sup> rib by forming axillary artery which is the main artery supplying left upper limb.



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Question:

Describe course of arch of aorta

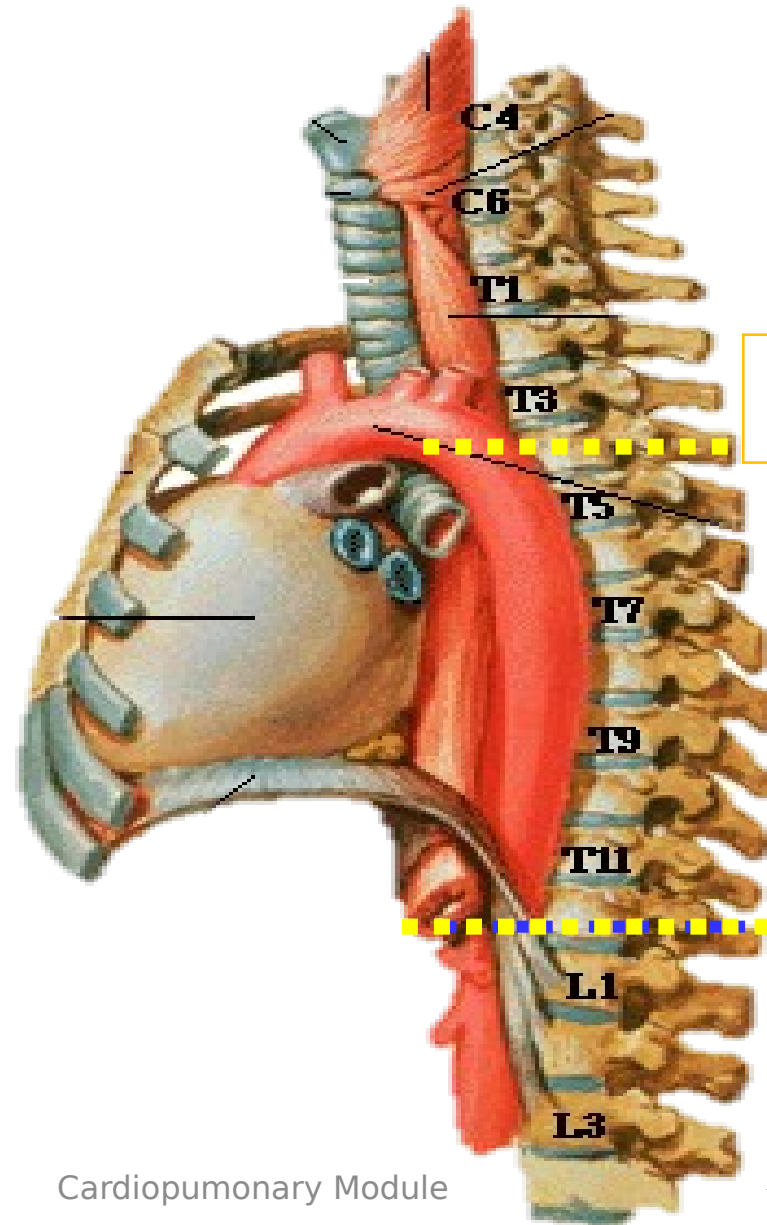
# Descending thoracic aorta

## Begins :

at lower border of **T4**  
as a continuation  
of arch of aorta.

## Ends :

at lower border of **T12** where it  
passes through  
aortic opening of  
diaphragm to  
become abdominal  
aorta.

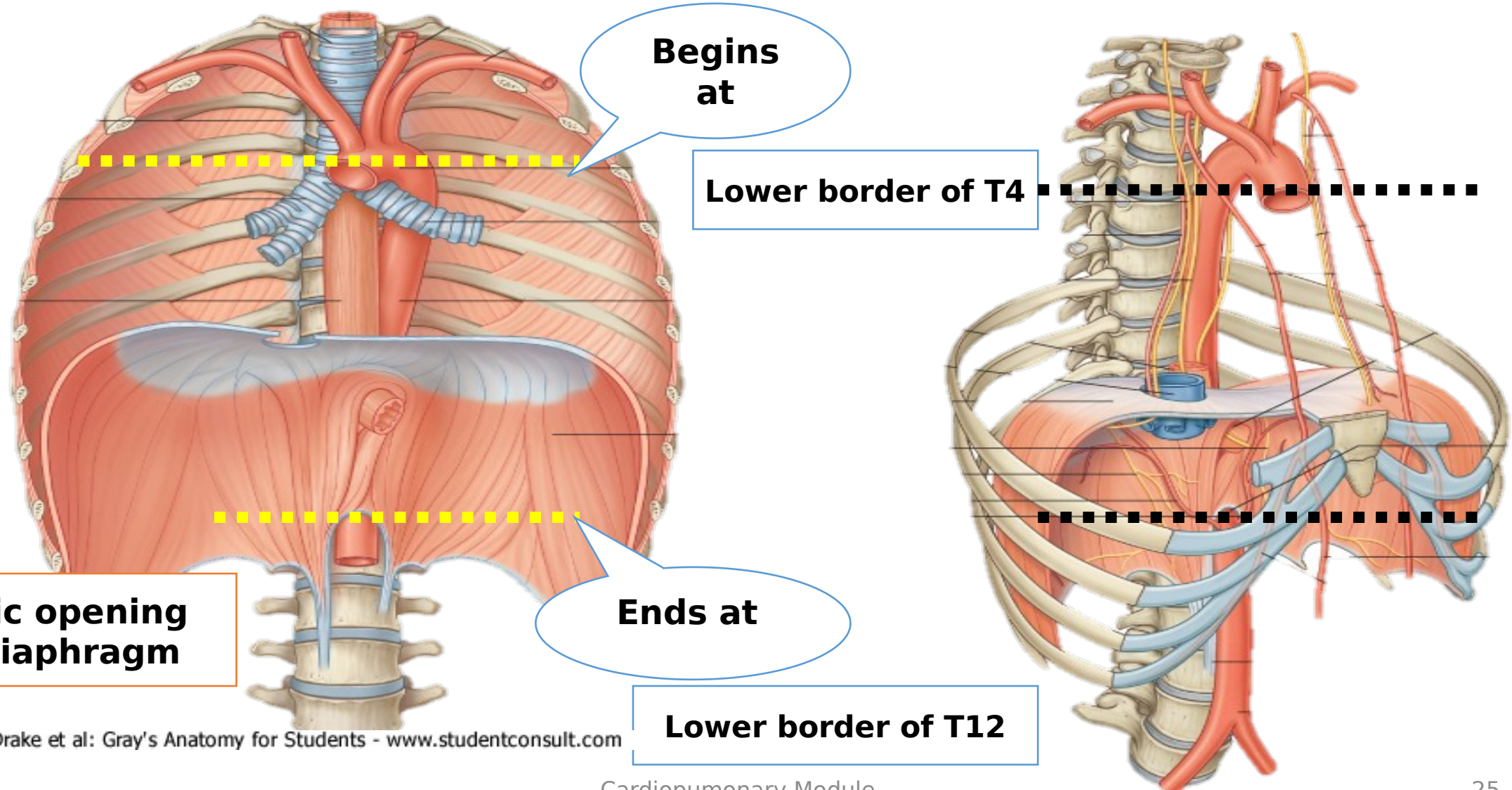


Begins at lower border  
of T4

Ends at lower border  
of T12



# Descending thoracic aorta

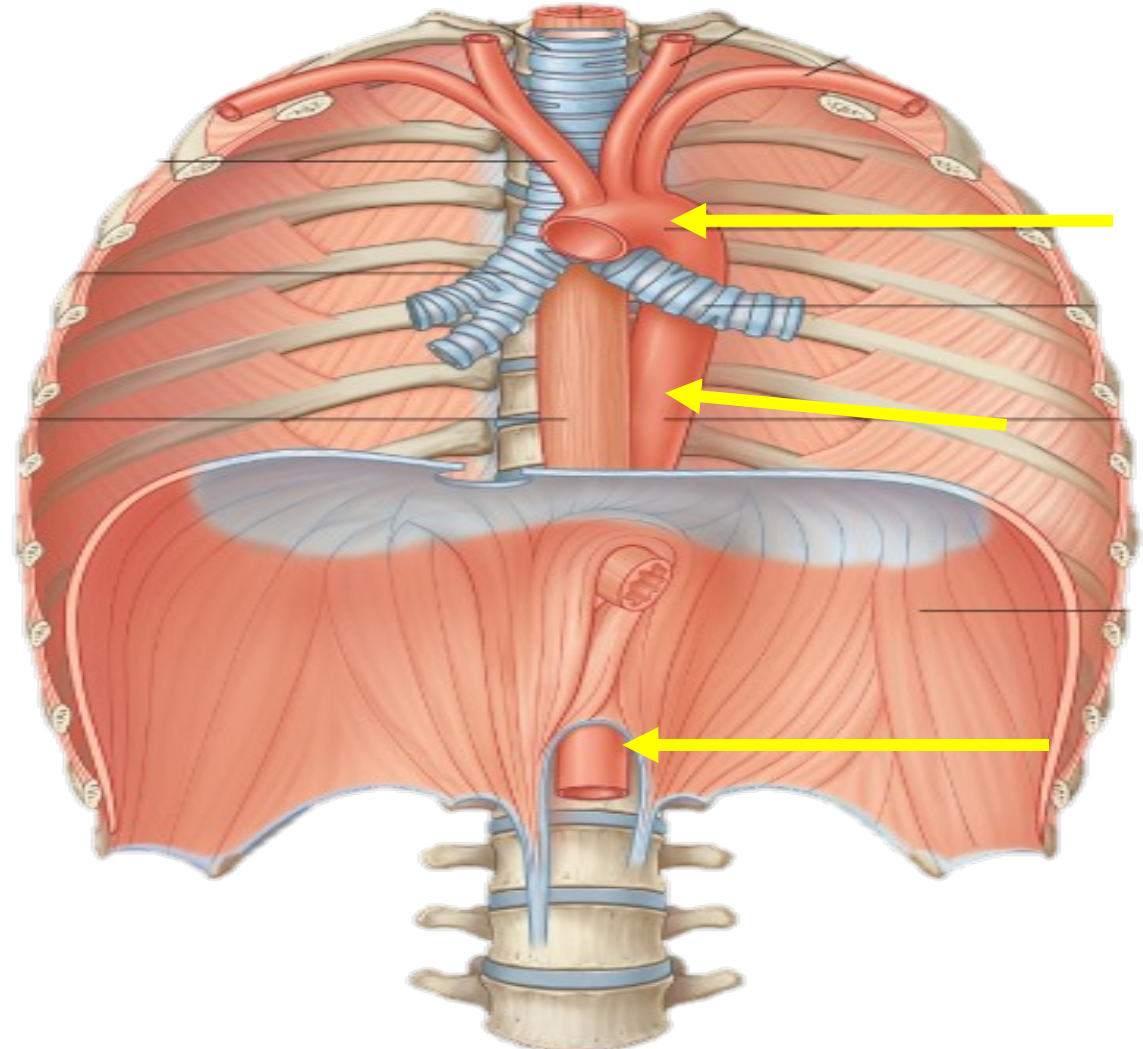




# Descending thoracic aorta

@ At its origin, it lies on the left side of the vertebral column.

@ As it descends into the posterior mediastinum, it becomes anterior to the lower thoracic vertebral bodies.

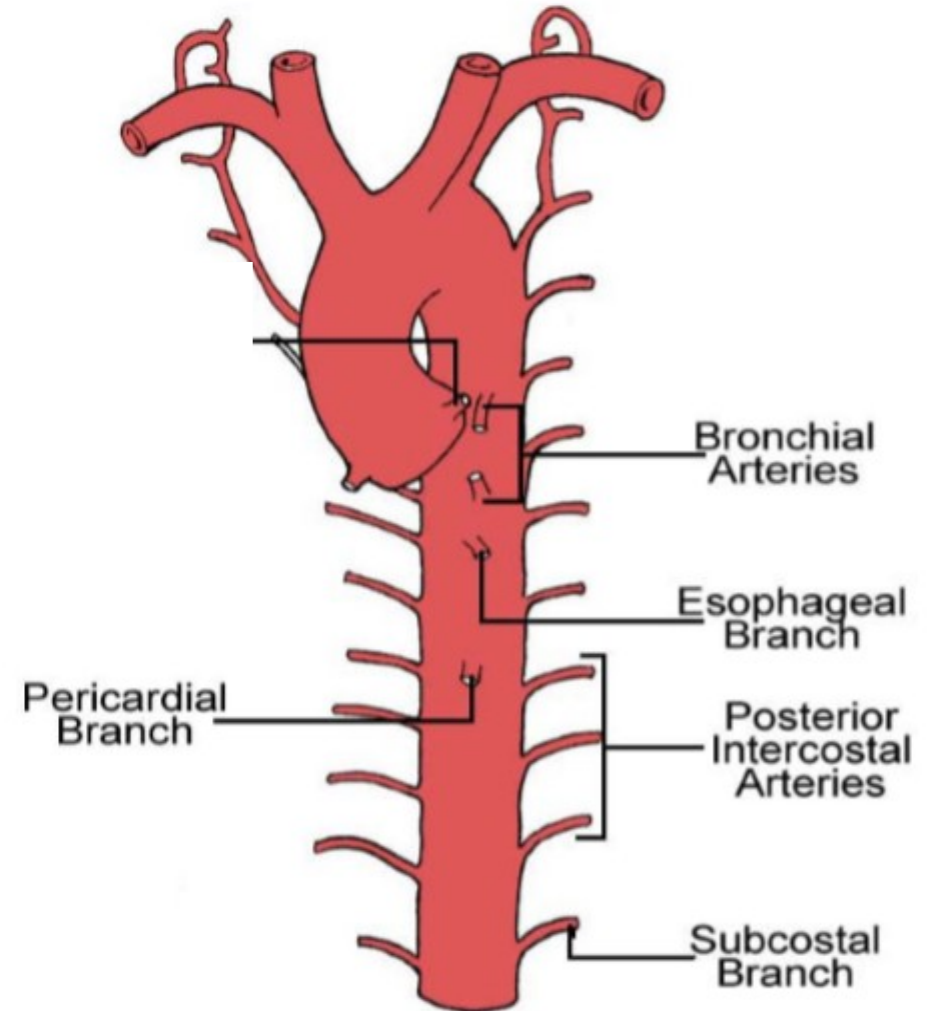


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# Branches of descending thoracic aorta

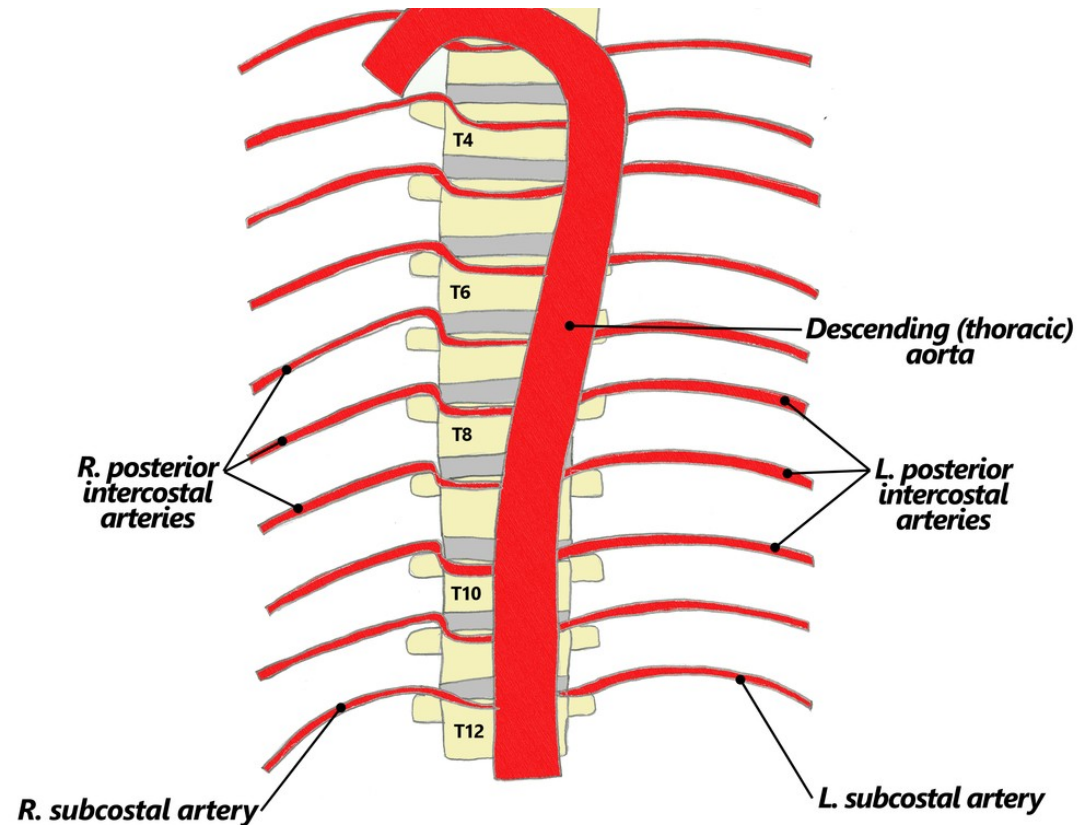
1. Pericardial branches.
2. Bronchial arteries ( to lungs).
3. Oesophageal branches.
4. Mediastinal branches.
5. Posterior intercostal (from 3<sup>rd</sup> till 11<sup>th</sup> on both sides).
6. Subcostal arteries ( Rt. & Lt) below last ribs.
7. Superior phrenic artery ( to upper surface of diaphragm).



# Branches of descending thoracic aorta

## Posterior intercostal arteries

from 3rd till 11th on both sides



<https://www.google.com.eg/url?sa=i&rct=j&q=&esrc=s&source=images&cd>





# Lecture Quiz



## Question

Enumerate branches of descending thoracic aorta

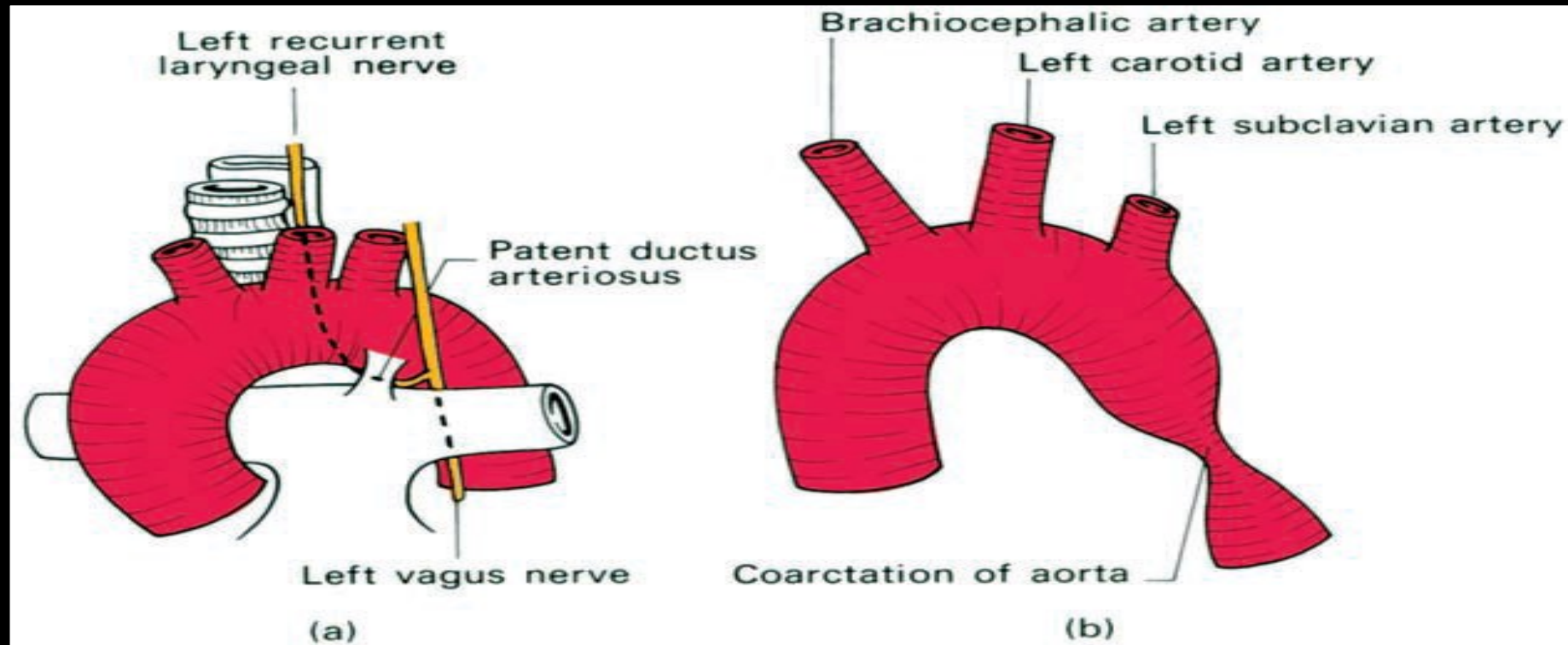


During a newborn examination, a pediatrician is unable to detect a pulse in the groin or legs of an infant and notes the lower extremities are cold to the touch. The pulse and blood pressure of the upper limbs are significantly elevated from normal. A pediatric cardiologist performs an echocardiogram and other imaging. The given sagittal MRI verifies the presence of what specific anomaly, as indicated by the white arrowhead?

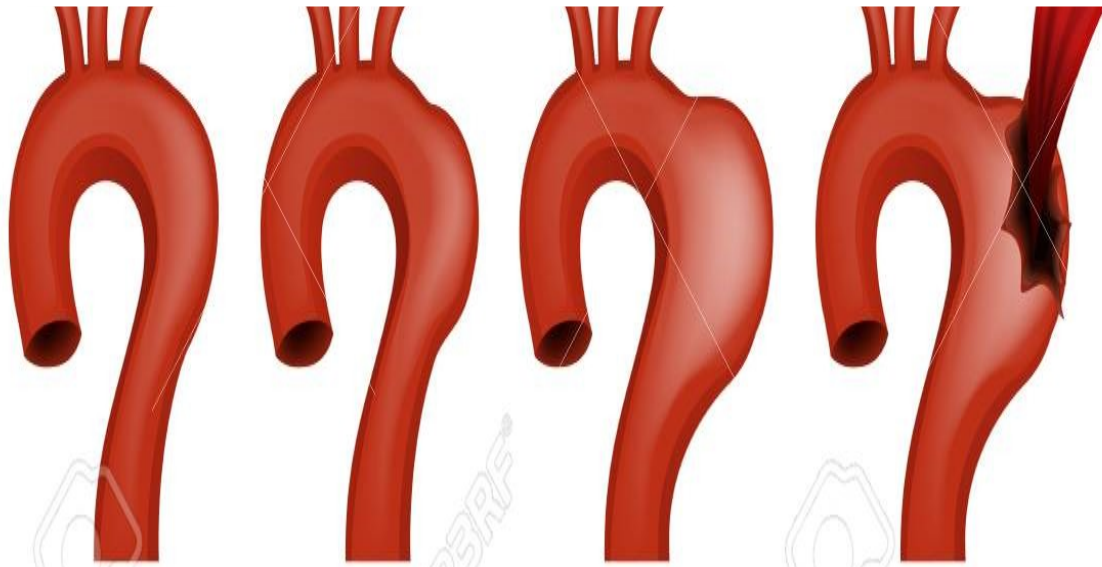


# Coarctation of the aorta

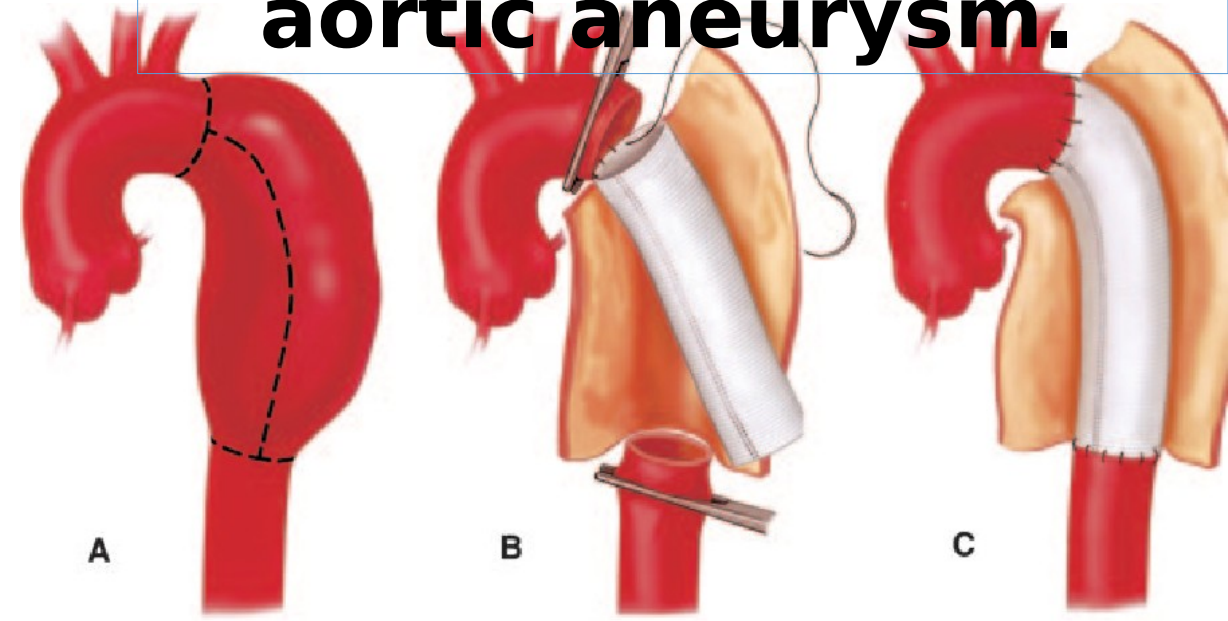
It is a congenital narrowing of the aorta just proximal, opposite, or distal to the site of attachment of the ligamentum arteriosum. Clinically, the cardinal sign of aortic coarctation is absent or diminished pulses in the femoral arteries of both lower limbs.



**An aortic aneurysm** is an enlargement (dilatation) of the **aorta** to greater than 1.5 times normal size. They usually cause no symptoms except when ruptured. Occasionally, there may be abdominal, back, or leg pain.



## Repair of a descending thoracic aortic aneurysm.





## ❑ Arteries of The Thorax

- Beginning
- Course
- Termination
- important relations
- Branches

## ❑ Correlation with relevant clinical significance



## SUGGESTED TEXTBOOKS



*Clinical Anatomy for Medical Students .Richard S. Snell*

*Gray's anatomy for students . Page 180- 182*

